IN THE SPECIFICATION

Please add the following paragraphs on page 1 after the title:

CROSS REFERENCE TO RELATED APPLICATION

This is a divisional of co-pending U.S. Application No. 09/605,558, filed on June 27, 2000, which is incorporated herein by reference to the extent permitted by law.

On page 4, please replace the third full paragraph with the following:

A "nucleic acid enzyme" is a nucleic acid molecule that catalyzes a chemical reaction. The nucleic acid enzyme may be covalently linked with one or more other molecules yet remain a nucleic acid enzyme. Examples of other molecules include dyes, quenchers, proteins, and solid supports. The nucleic acid enzyme may be entirely made up of ribonucleotides, deoxyribonucleotides, or a combination of ribo- and ~~doxyribonucleotides~~ deoxyribonucleotides.

On page 4, please replace the fourth paragraph with the following:

A "sample" may be any solution that may contain an ion (before or after pre-treatment). The sample may contain an unknown concentration of an ion. For example, the sample may be paint that is tested for lead content. The sample may be diluted yet still ~~remains~~ remain a sample. The sample may be obtained from the natural environment, such as a lake, pond, or ocean, an industrial environment, such as a pool or waste stream, a research lab, common household, or a biological environment, such as blood. Of course, sample is not limited to the taking of an aliquot of solution but also includes the solution itself. For example, a biosensor may be placed into a body of water to measure for contaminants. In such instance, the sample may comprise the body of water or a particular area of the body of water. Alternatively, a solution may be flowed over the biosensor without an aliquot being taken. Furthermore, the

sample may contain a solid or be produced by dissolving a solid to produce a solution. For example, the solution may contain soil from weapon sites or chemical plants.

On page 5, please replace the third paragraph with the following:

FIG. 1. Selection scheme for RNA-cleaving deoxyribozymes. **FIG. 1A.** (SEQ ID NO: 12) Starting pool of random-sequenced DNAs, engineered to contain two substrate-binding domains. Each member of the pool contains a 5'terminal biotin (encircled B), a single embedded ribonucleotide (rA) and a 40-nucleotide random sequence domain (N40). **FIB. 1B.** Selective amplification scheme for isolation of DNA that catalyzes the metal cofactor (Co^{2+} or Zn^{2+}) dependent cleavage of an RNA phosphodiester.

On page 5, please replace the fourth paragraph with the following:

FIG. 2. (SEQ ID NOS 13-23, respectively, in order of appearance) Sequence classes of the clones Zn-DNA. The numbers on the left are the clone-numbers randomly assigned to the sequence during the cloning and sequencing process. The highly conserved sequences (Region-20nt) are in bold. The covariant nucleotides are underlined. The 5'- and the 3"-primer binding sequences are shown in italic.

On page 6, please replace the first paragraph with the following:

FIG. 3. (SEQ ID NOS 24-42, respectively, in order of appearance) Sequence classes of the cloned Co-DNA. The clone-numbers are listed on the left. The 5' and the 3' primer binding sequences are in italic.

On page 6, please replace the second paragraph with the following:

FIG. 4. (SEQ ID NOS 43-70, respectively, in order of appearance) Sequence alignment of the N40 region of the reselected Zn-DNAs. The wild-type sequence is listed on the top, followed by the reselected Zn-DNA sequences. Only the point mutations are shown for the reselected sequences, while the nucleotides that are identical to the wild type at the corresponding positions are omitted. Numbers listed to the left are clone-numbers. The rate constants (k_{obs}) of several reselected Zn-DNA in 100 μM Zn^{2+} are shown on the right.

On page 6, please replace the third paragraph with the following:

FIG. 5. (SEQ ID NOS 1 & 2) Proposed secondary structure of the Zn(II)-dependent *trans*-cleaving deoxyribozyme.

On page 6, please replace the fourth paragraph with the following:

FIG. 6. Sequences and proposed secondary-structures of several RNA-cleaving deoxyribozymes. **FIG. 6A.** (SEQ ID NOS 71 & 72) **and Fig. 6B.** (SEQ ID NOS 73 & 74) The deoxyribozyme selected using Mg^{2+} or Pb^{2+} as cofactor (Breaker & Joyce, 1994, 1995). **FIG. 6C. and FIG. 6D.** The 10-23 and the 8-17 deoxyribozymes selected in Mg^{2+} to cleave all-RNA substrate (Santoro & Joyce, 1997). **FIG. 6E.** A deoxyribozyme selected using L-histidine as cofactor. **FIG. 6F.** The 17E deoxyribozyme selected in Zn^{2+}. In each structure, the upper strand is the substrate and the lower strand is the enzyme. Arrows identify the site of RNA transesterification.

On page 6, please replace the fifth paragraph with the following:

FIG 7. Comparison of G3 deoxyribozyme with class II Co-DNA. **FIG. 7A.** (SEQ ID NO 83) The predicted secondary structure of the G3 deoxyribozyme (Geyer & Sen, 1997). X represents variable sequences. The boxed region was also found in class II Co-DNA. **FIG. 7B.** (SEQ ID NO 84) The minimal structure motif of the class II Co-DNA predicted by *mfold* program. The arrows indicate the cleavage sites.

On page 28, please replace the second paragraph with the following:

Individual sequences of the cloned Zn-DNA and Co-DNA were randomly chosen and sampled for activity. Under the selection conditions (100 μM Zn^{2+}, 500 mM NaCl, 50 mM HEPES, pH 7.0 25°C), the observed rate constants of Zn-DNAs from sequence-classes 1 and II were 0.1-0.2 min^{-1}, while class III sequences were less active, with k_{obs} around 0.02 min^{-1}. The cleavage rate of the initial pool was 2 x 10^{-7} min^{-1}. Therefore, a 10^5-10^6 fold increase in cleavage rate has been ~~achieve~~ achieved for Zn-DNA selection. The cleavage rates of all the randomly picked Co-DNA sequences were <0.02 min^{-1} under the conditions for Co-DNA selections (100 μM Co^{2+}, 1 M NaCl, 50 mM HEPES, pH 7.0, 25°C). Interestingly, even in the buffer (1 M NaCl, 50 mM HEPES, pH 7.0) alone, the class II Co-DNA exhibited similar activity as in the presence of 100 μM Co^{2+} or Zn^{2+}.